

Quiz 1

MATH 100:11 Mathematical Concepts
Instructor: Tara Taylor

September 22, 2011

Name:

SOLUTIONS

You may use calculators, but each question can be done without them. This quiz is double-sided! Be sure to explain your answers. Even if you get the correct answer, you may not get full marks if you haven't explained how. However, if you don't get the correct answer, you may get partial marks for trying something- so don't leave anything blank! The total quiz is out of 10, and the mark value for each question is given beside the question.

1. Consider the following sequence:

[5]

2, 5, 8, 11, 14, ...

- (a) What are the most likely next two numbers in the sequence?
- (b) What type of reasoning did you use? Circle one: inductive/deductive
- (c) If the sequence were to keep going, following the same pattern, what would the 100th number be?
- (d) Find the sum

$$2 + 5 + \dots + 299$$

a) 2, 5, 8, 11, 14, ... seems to be going up by 3 each time
so next 2 numbers are 17 & 20

b) inductive

c) 1st - 2 2nd - 5 3rd - 8 ... $n^{\text{th}} = 3n - 1$
so 100th is $300 - 1 = 299$

$$\begin{array}{r} \text{d) } 2 + 5 + \dots + 299 = S \\ 299 + 296 + \dots + 2 = S \\ \hline (301) + (301) + \dots + (301) = 2S \\ \underbrace{\hspace{10em}}_{100 \text{ of them}} \end{array}$$

$$\begin{aligned} 2S &= 100(301) \\ \rightarrow S &= \frac{(100)(301)}{2} \\ &= 15050 \end{aligned}$$